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EXAMINER

PANNALA, SATHYANARAYA R

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 06212005

Application Number: 09/512,949  
Filing Date: February 25, 2000  
Appellant(s): CHA ET AL.

John L. Rogitz, Reg. No. 33,549  
For Appellant

**SUPPLEMENTAL EXAMINER'S ANSWER**

This is in response to the Third Supplemental Appeal Brief filed on October 20, 2004.

**(1) Real Party in Interest**

A statement identifying the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

A statement identifying the related appeals and interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) Status of Claims**

The statement of the status of the claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment has been filed.

**(5) Summary of Invention**

The summary of invention contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The grounds of rejection to be reviewed on appeal is contained in the brief is correct.

**(7) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Prior Art of Record**

US Patent 6,263,334	Fayyad et al.	July 17, 2001
	Filing date	November 11, 1998
US Patent 5,619,717	Staats	April 8, 1997

Oregon University paper

Dept. of Mathematics

July 7, 1996

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 8-14 and 23 are rejected under 35 U.S.C. 101 as non-statutory subject matter.

Claims 1-4, 8-12, 15-18 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fayyad et al. (US Patent 6,263,334) and in view of "Coordinate Systems in Two and Three Dimensions", (Department of Mathematics, Oregon University 1996). This rejection is set forth in the reopened prosecution of Non-Final Office Action.

Claims 5-7, 13-14 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fayyad et al. (US Patent 6,263,334), in view of "Coordinate Systems in Two and Three Dimensions", (Department of Mathematics, Oregon University 1996) and further in view of Staats (US Patent 5,619,717). This rejection is set forth in the reopened prosecution of Non-Final Office Action.

***Claim Rejections - 35 USC § 101***

1. In view of the Remand received from the Board of Patent Appeals and interferences on 7/02/2004, PROSECUTION WAS REOPENED and a new ground of rejection was set forth in the Office Action mailed on 10/4/2004.

***Oath/Declaration***

2. A new oath or declaration is required because there is a non-initialed alteration. The wording of an oath or declaration cannot be amended. If the wording is not correct or if all of the required affirmations have not been made or if it has not been properly subscribed to, a new oath or declaration is required. The new oath or declaration must properly identify the application of which it is to form a part, preferably by application number and filing date in the body of the oath or declaration. See MPEP §§ 602.01 and 602.02. This issue was already decided on PETITION as requiring a new oath/deceleration.

***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 8-14 and 23 are rejected under 35 U.S.C. 101, because independent claim 8 is directed to a computer program product including a program of instructions, which is a non-statutory subject matter. Claims 9-14 and 23 depend from claim 8.

5. As per independent claim 8, the preamble recites "A computer program product including a program of instructions" as drafted, said claim is not technologically embodied on a computer readable medium (See *In re Waldbaum*, 173 USPQ 430 (CCPA 1972); *In re Musgrave*, 167 USPQ 280 (CCPA 1970) and *In re Johnston*, 183 USPQ 172 (CCPA 1974) also see MPEP 2106 IV 2(b), even though said claim is limited to a useful, concrete and tangible application (See *State Street v. Signature financial Group*, 149 F.3d at 1374-75, 47 USPQ 2<sup>nd</sup> at 1602 (Fed Cir. 1998); *AT&T Corp. V. Excel*, 50 USPQ 2<sup>nd</sup> 1447, 1452 (Fed. Cir. 1999).

Also, dependent claims 9-14 and 23 are rejected under 35 U.S.C. 101.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and

invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-4, 8-12, 15-18, 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fayyad et al. (US Patent 6,263,334) and in view of "Coordinate Systems in Two and Three Dimensions", (Department of Mathematics, Oregon University, 1996).

8. As per independent claims 1, 8 and 15, Fayyad teaches the following:  
"for at least some data vectors in a data space, generating respective approximations" Approximation is interpreted as probability function at Figs. 7 & 8, col. 7, lines 55-67 to col. 8, lines 1-14.

"based on the approximations, returning "k" nearest neighbors to the query." at Figs. 2B, col. 4, lines 55-67 to col. 5, lines 1-3.

Fayyad does not teach explicitly polar coordinates. However, Oregon University teaches converting Cartesian to Polar coordinates and vice versa (figure, page 1, paragraph "Polar Coordinates"). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention to incorporate the teachings of the cited references because the process of converting Cartesian to Polar coordinates by Oregon University's would have provided Fayyad's with necessary method, which is convenient to use a Polar coordinate system (see Oregon University, page 1, paragraph "Introduction"). Further, by

combining Oregon University conversion method would have allowed Fayyad's method to use polar coordinate system because easy and convenient to use in which circular, cylindrical or spherical symmetry is present (see Oregon university, page 1, paragraph "Introduction").

9. As per dependent claims 2, 10 and 16, Fayyad teaches the following:  
"dividing the data space into plural cells" at Fig. 3A, col. 5, lines 4-8;  
"representing at least one data point in at least one cell in polar coordinates with respect to the at least one cell." at Fig. 3B, col. 5, lines 19-31;
10. As per dependent claims 3, 11 and 17, Fayyad teaches the following:  
"determining a number of "b" bits to be assigned to each cell." at Fig. 4D, col. 7, lines 1-17;  
"dividing the data space into  $2^{bd}$  cells." at Fig. 4D, col. 7, lines 23-36.
11. As per dependent claims 4 and 18, Fayyad teaches "generating a candidate set of approximations based at least on the lower bounds  $d_{min}$  of the approximations" at Fig. 9A, col. 12, lines 46-54.
12. As per dependent claim 9, Fayyad teaches "the means for generating generates respective approximations of data vectors  $p$  in local polar coordinates." at Fig. 2, col. 8, lines 35-43.



13. As per dependent claim 12, Fayyad teaches "computer readable code means for generating a candidate set of approximations based at least on the lower bounds  $d_{min}$  and upper bounds  $d_{max}$  of the approximations. at Fig. 9A, col. 12, lines 46-59.

14. As per dependent claims 22, 23 and 24, Fayyad teaches "generating a candidate set of approximations based at least on the upper bounds  $d_{max}$  of the approximations." at Fig. 9A, col. 13, lines 7-10.

15. Claims 5-7, 13-14, 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fayyad et al. (US Patent 6,263,334) and in view of "Coordinate Systems in Two and Three Dimensions", (Department of Mathematics, Oregon University, 1996) as applied to claims 1-4, 8-12, 15-18 and 22-24 and further in view of Staats (US Patent 5,619,717).

16. As per claims 5, 13 and 19, Fayyad teaches "adding a first approximation having a first lower bound  $d_{min1}$  to the candidate set if  $d_{min1} < k\text{-NNdist}(q)$ , wherein  $k\text{-NNdist}(q)$  is the  $k$ th largest distance between the query vector  $q$  and nearest neighbor vectors  $p$ ." Fayyad and Oregon University does not teach explicitly using vectors in nearest neighbor search. However, Staats teaches for determining the nearest neighbor of a data vector. (Figs. 2 & 4, col. 6, lines 62-67 to col. 7, lines 1-36). Thus, it would have been obvious to one of ordinary skill in the data processing art at the time of the invention decide to incorporate the teachings of the cited references because the

process of determining the nearest neighbor of a data vector by Staats' would have provided Fayyad's with necessary method, which is more efficient vector quantizers to use efficient search technique (see Staats, col. 2, lines 11-12). Further by combining Staats method would have allowed Fayyad's method to determine the closest vector quantization to the input vector using tree searched vector quantization codebook (see Staats, col. 2, lines 4-6).

17. As per dependent claims 6, 14 and 20, Staats teaches "using the candidate set to return "k" nearest neighbors vectors p to the query vector q." at Figs. 5, col. 8, lines 62-67.

18. As per dependent claims 7 and 21, Staats teaches "not all vectors p corresponding to approximations in the candidate set are examined to return the 'k' nearest neighbors." at Figs. 5, col. 9, lines 1-4.

#### ***(10) Response to Arguments***

Remand by the Board of Patent Appeals and Interferences, mailed on 7/2/2004, is stated as the Office of the Group Directors of Technology Center has requested that the application be remanded to the jurisdiction of the patent examiner to reconsider the issues in the appeal. As stated in the earlier non-final Office Action mailed on 10/4/2004, a new ground of rejection is set forth. During the process of the Office

Action, obtained the approval of the Primary Examiner, and the Supervisory Patent Examiner and did not obtain the Director's approval as it is not necessary.

Regarding the argument on the defective declaration, as per MPEP 602.01, it states that the Oath/Declaration cannot be changed. Its validity can be determined, if there is no correction or in case of a correction must be initialed by the inventor. MPEP 602.01 does not support another alternate solution or a visual cursory comparison method. This matter has already been decided on petition.

**A. Response to Appellant's Argument Regarding Claims 8-14, and 23 rejected under U.S.C. 101 as "non-statutory subject matter".**

Examiner noticed while reexamining the application that the claims 8-14 and 23 fail to satisfy the statutory subject matter and decided to reopen the prosecution to give an opportunity for the Appellant to amend the claims to overcome the rejection under 37 U.S.C. 101 and mailed a non-final Office Action instead of writing a Supplemental Examiner's Answer with a new rejection under 37 U.S.C. 101. The Applicant chose the second option of sending the response as a Supplemental Appeal Brief. Appellant considered the non-final Office Action by mistake as a Supplemental Examiner's Answer.

Appellant's argument of Computer program product is the same as computer readable medium is not justifiable, computer program product is considered as software and it is possible to write on a sheet of paper with a pen or pencil and therefore it is not considered as a computer readable medium.

Appellant's argument on "computer program product" is not persuasive and no justification on the basis of MPEP and the appellant did not amend the claims to overcome the 37 U.S.C. 101 rejection.

The Examiner respectfully traverses Appellant's argument regarding Prior Arts of Fayyad et al. (US Patent 6,263,334), Staats (US Patent 5,619,717) and "Coordinate Systems in Two and Three Dimensions" (Oregon University 1996).

**B. Response to Appellant's Argument Regarding Claims 1-4, 8-12, 15-18, and 22-24, That Fayyad et al., Staats and Oregon University Paper Fails to Disclose "Polar Coordinates."**

Appellant's argument on the replacement of one secondary reference showing polar coordinates (Apple Computer) with another (Oregon University). Examiner, changed the reference because during the prior art search found a better teaching published paper. The basic concept or formula used for converting from Cartesian coordinates to Polar coordinates and vice versa, did not change or will not be changed. Apple Computer's paper and as well as Oregon University's paper teaches the same

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topic, but Oregon University paper teaches a better way than the Apple Computer's paper.

Appellant's specification addresses the problem associated with implementing queries for nearest neighbor in high dimensional data spaces using "polar coordinates". Polar coordinate system is used for shapes that have symmetry about a point. Polar coordinate system deals with a radius and an angle, (used to draw circles) ( see Oregon University teaches converting Cartesian to Polar coordinates). Cartesian coordinates system is well known and used on computer screens to draw all graphics. **In order to draw polar coordinates on computer screen, it is well known that the coordinates have to be converted into Cartesian coordinates** and the formulas used are:

$$X \text{ Coordinate} = \text{Cosine}(\text{angle}) * \text{radius}$$

$$Y \text{ Coordinate} = \text{Sine}(\text{angle}) * \text{radius}$$

The invention deals with computers in querying a database for nearest-neighbor using polar coordinates.

**C. Response to Appellant's argument of "Why the prior art motivates one to convert or change Fayyad et al.'s Cartesian system to polar. Indeed, no proffer of why a reasonable expectation of success exists in converting Fayyad et al.'s invention to polar has been made. As it is simply converting Fayyad et al.'s Cartesian system to polar would destroy the efficacy of its equations to execute nearest neighbor searches."**

The claimed invention is the same as prior art except using a different coordinate system (see Fayyad at Figs. 7 & 8, col. 7, lines 55-67 to col. 8, lines 1-14 and Figs. 2B, col. 4, lines 55-67 to col. 5, lines 1-3) and in order to achieve the required (Appellant's) polar coordinate system a well-known conversion method is suggested (see at Oregon University teaches converting Cartesian to Polar coordinates). **In order to draw polar coordinates on computer screen, it is well known that the coordinates have to be converted into Cartesian coordinates.**

**D. Response to Appellant's argument of "dimensionality  $d$ ,  $d_{min1} < k\text{-NNdist}(q)$ , approximation and  $k\text{-NNdist}$  does not lack enabling disclosure."**

When the specification is not documented properly, a person of skilled in art will not understand the invention details even after reading several times. Appellant did not explain the notations before or after an equation,  $d_{min1} < k\text{-NNdist}(q)$  on page 9, line 7 of the specification. The " - " in  $K\text{-NNdist}(q)$  typically means subtraction operation. However, in this case, it is unclear if this is an operation or should be treated as a single variable regardless of common characters with common arithmetic operation. Thus, it is confusing to read and lack proper disclosure. How should an artisan who be able to evaluate without undue experimentation. The totality of the specification simply lacks proper enabling disclosure.

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The variable, dmin1 is not enabled in the specification as well. The only the mention of this variable is page 4, line 5 of the specification. This causes a skilled artisan to be burdened with undue experimentation.


**(11) Conclusion**

The claimed invention is available in the prior art with a difference in coordinate system. A simple conversion method into inventor used polar system is also prior art.


In addition to this, the invention lacks proper documentation in the specification and lot of questions arise to a person of ordinarily skilled in the art for implementing the invention in the real world.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

  
Sathyanarayan Pannala  
Examiner  
Art Unit 2167

srp  
June 23, 2005

  
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